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Around 60 percent of infants are born jaundiced and many spend their first days of life isolated from their mothers underneath special lights that help them eliminate the excess bilirubin in their bloodstreams.

Three College of Engineering students at Michigan State University have created a prototype of a device that breaks down bilirubin molecules while the baby is coddled in the loving arms of its mother.

Their project, called Swaddle-mi-Bili, is one of 150 innovative projects showcased at the MSU College of Engineering 20th Anniversary Design Day on Friday, April 25. The 8 a.m. to noon event is open to the public in the Engineering Building on the MSU campus at 428 S. Shaw Lane, East Lansing, Mich.

Students Oliver Bloom, Vu Hoang, and Alexa Jones created Swaddle-mi-Bili, a wearable treatment for infant jaundice. The prototype uses fiber optics inside an infant’s swaddle blanket as a friendlier means for light transfer.

“Jaundice is a disease of newborns,” said Jones, a biosystems engineering senior from Metamora, Mich. “Infants born with jaundice have an excess of bilirubin molecules building up in their bloodstream. It presents itself as a yellowing of the skin or eyes. Therapy using blue visible light breaks down the molecule so it can be harmlessly excreted from the baby’s body.”

The trio met with 85 nurses and doctors, primarily at Hurley Medical Center in Flint, but also with neonatal staff at Sparrow Hospital in Lansing during the customer discovery phase of their research. Their goal was to find a treatment that allows the parents to hold their newborns during treatment, which usually involves isolating the baby in incubators or on small inflexible pads during those first precious days of bonding time.

“We set out to improve on the traditional phototherapy method and came up with the swaddle idea,” she said.

“The blue light is what provides the treatment,” explained Bloom, a biosystems engineering student from Holly, Mich.
“The medical staffs loved the idea and were ecstatic about it.”

Hoang, a biosystems engineering student from Okemos, Mich., noted that the wearable solution could reduce the cost of treatment and allow for easy deployment in low-income areas of the United States.

Swaddle-mi-Bili has already won a student business model competition in Lansing and finished in the top eight of 84 teams at the Michigan Collegiate Innovation Prize competition, both in February. The team will compete at the International Business Model Competition at Brigham Young University in May.

All three students will graduate from Michigan State in May. Bloom will continue his studies in a biomedical engineering master’s degree program at the University of Michigan, Hoang will enter the operations management training program at global food giant Heinz Company, and Jones will enter the analyst program with the multinational investment banking firm Goldman Sachs.

Hoang said the lessons learned by the team were tremendous. “We’ve learned so much about engineering, business and team work,” he added.

About Design Day

The 20th anniversary of the MSU College of Engineering Design Day will feature the innovation and technical skills of more than 600 students on Friday, April 25. Participants and guests will roam the busy halls of the Engineering Building to see demonstrations, competitions and posters from 8 a.m. to noon.

Read more on the 20th anniversary of Design Day at: http://www.egr.msu.edu/news/2014/04/18/20th-design-day-friday-april-25

Related Website: Design Day video
Design Day project descriptions and team photos
Faculty Advisor - Dr. Tim Whitehead

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